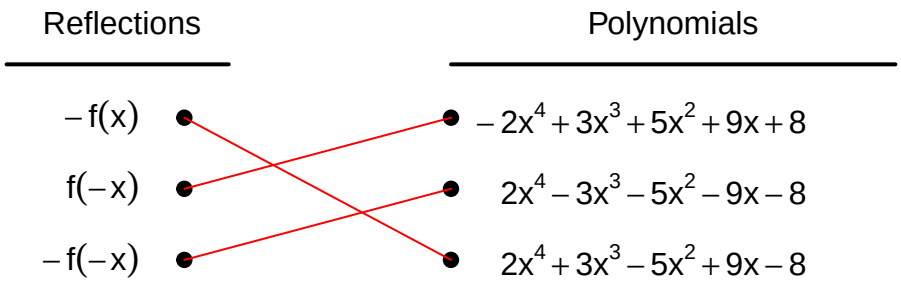
Name: Date:

Exam: Function Reflections (Solution version 47)

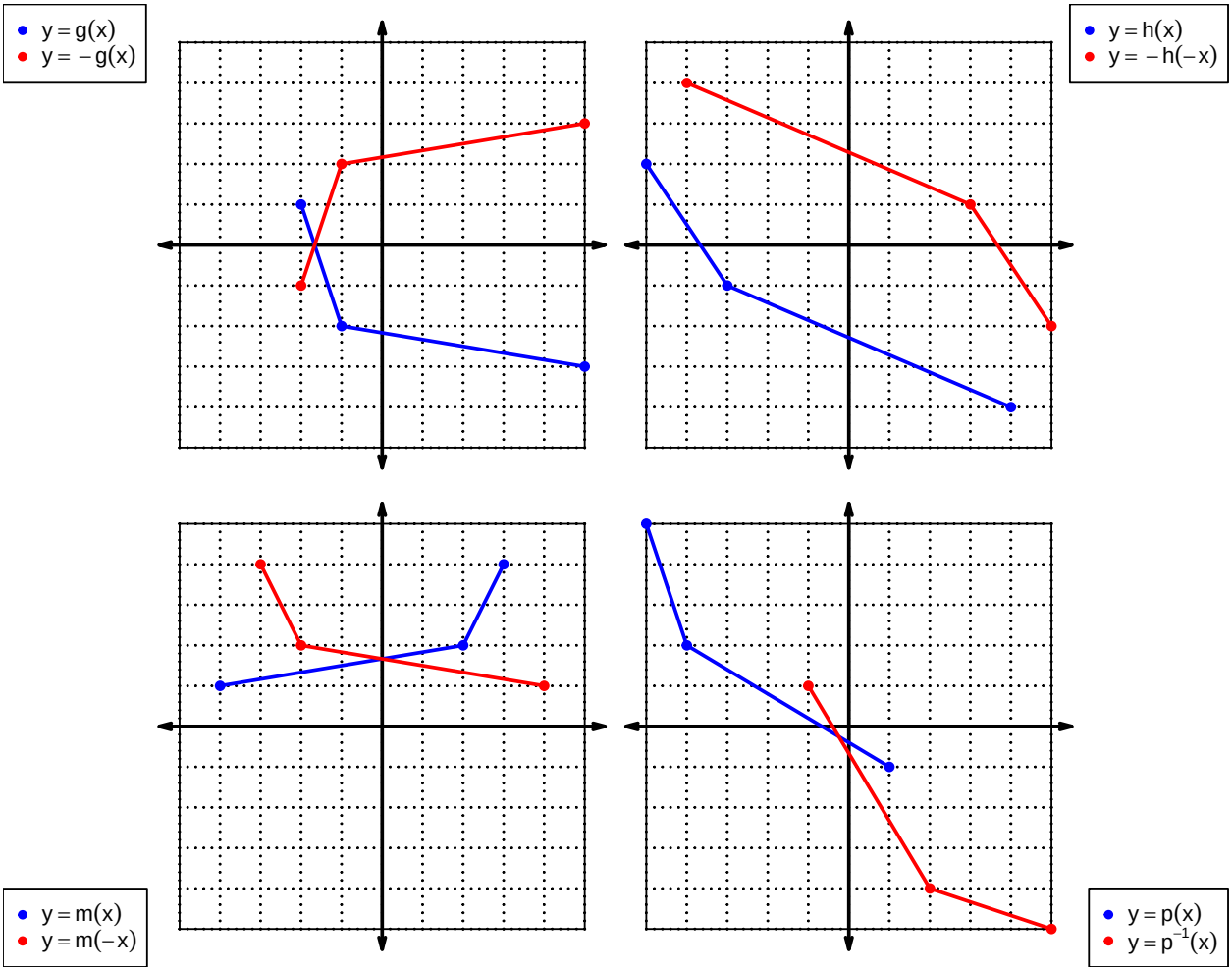
1. Let function f be defined by the polynomial below:

$$f(x) = -2x^4 - 3x^3 + 5x^2 - 9x + 8$$

Draw lines that match each function reflection with its polynomial:



2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	5	2	6
2	8	4	1
3	7	6	2
4	3	9	7
5	6	8	3
6	4	7	8
7	9	1	5
8	2	3	4
9	1	5	9

3. Evaluate $f(3)$.

$$f(3) = 7$$

4. Evaluate $g^{-1}(9)$.

$$g^{-1}(9) = 4$$

5. Assuming h is an **odd** function, evaluate $h(-8)$.

If function h is odd, then

$$h(-8) = -4$$

6. Assuming f is an **even** function, evaluate $f(-6)$.

If function f is even, then

$$f(-6) = 4$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.
   Let polynomial p be defined with the following equation:

$$p(x) = -x^2 - x$$

   a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^2 - (-x)$$
$$p(-x) = -x^2 + x$$

   b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -\left(-x^2 + x\right)$$
$$-p(-x) = x^2 - x$$

   c. Is polynomial p even, odd, or neither?

   neither

   d. Explain how you know the answer to part c.

   We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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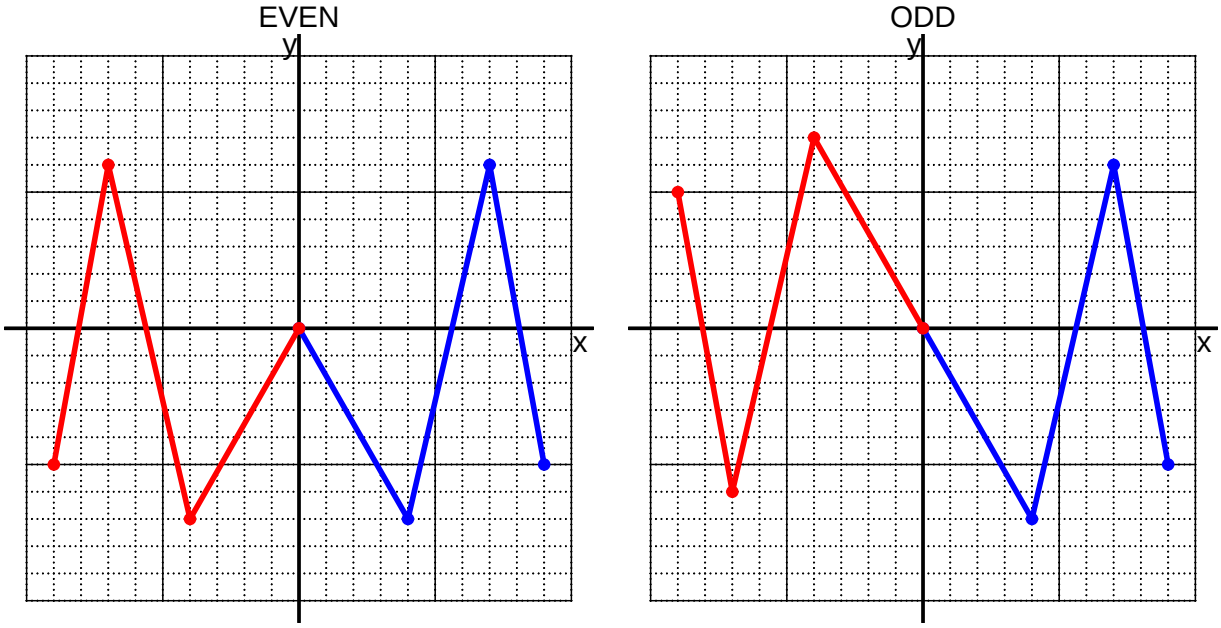
8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = \frac{x}{4} - 3$$

a. Evaluate $f(60)$.

step 1: divide by 4
step 2: subtract 3

$$f(60) = \frac{(60)}{4} - 3$$
$$f(60) = 12$$

b. Evaluate $f^{-1}(7)$.

step 1: add 3
step 2: multiply by 4

$$f^{-1}(x) = 4(x+3)$$
$$f^{-1}(7) = 4((7)+3)$$
$$f^{-1}(7) = 40$$

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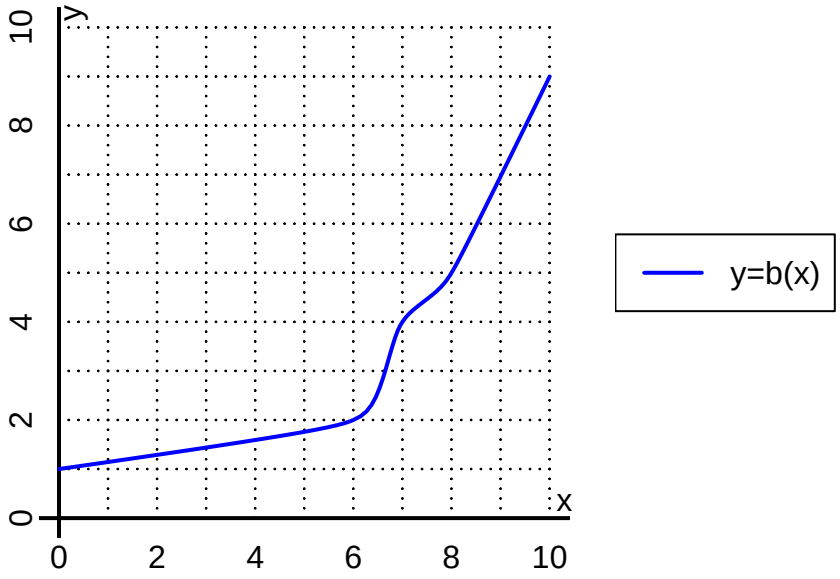
10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(8)$.

$b(8) = 5$

b. Evaluate $b^{-1}(2)$.

$b^{-1}(2) = 6$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-3	3	-3	3
-1	9	-9	9	-9
0	0	0	0	0
1	9	-9	9	-9
2	-3	3	-3	3

b. Is function f even, odd, or neither?

even

c. How do you know the answer to part b?

Function f is even because column $f(-x)$ matches column $f(x)$ exactly.